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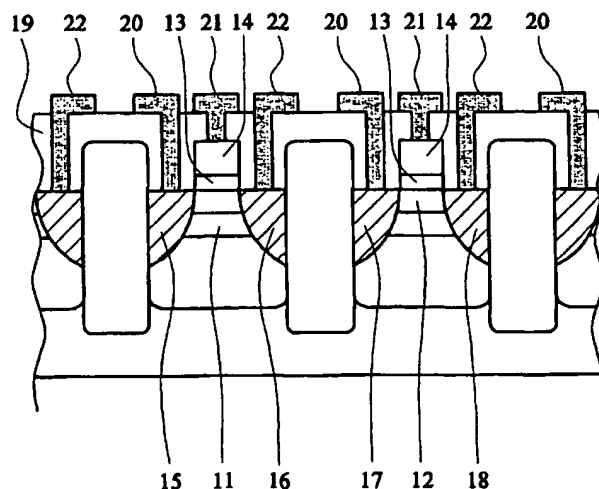
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(54) Title: METHOD OF ISOLATING ADJACENT COMPONENTS OF A SEMICONDUCTOR DEVICE



(57) Abstract: A method of isolating adjacent transistors in CMOS devices having strained silicon (12) and silicon germanium alloy (11) layers is disclosed. A semiconductor device combines in a single CMOS device the advantages of surface n-channel strained silicon MOSFETs with those of buried p-channel compressively strained silicon-germanium MOSFETs, without the need to compromise the performance of either type of transistor. By forming electrically insulating barrier regions (8) before formation of the strained silicon layer (12), this avoids the problem of high temperature processing steps causing germanium to diffuse from layer (11) into the channels of transistors in layer (12) and thereby degrading the performance of the n-channel transistors formed by the method.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

INTERNATIONAL SEARCH REPORT

International Application No.

PCT/GB 03/01863

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01L21/762

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TAKAGI S ET AL: "Device structure and electrical characteristics of strained-Si-on-insulator (strained-SOI) MOSFETs" E-MRS 2001 SPRING MEETING, SYMPOSIUM D: SECOND INTERNATIONAL CONFERENCE ON SILICON EPITAXY AND HETEROSTRUCTURES, STRASBOURG, FRANCE, 4-8 JUNE 2001, vol. B89, no. 1-3, pages 426-434, XP002262654 Materials Science & Engineering B (Solid-State Materials for Advanced Technology), 14 Feb. 2002, Elsevier, Switzerland ISSN: 0921-5107	1-4
Y	page 428, column 2, line 2 -page 430, column 1, line 1; figures 4,5 --- -/--	6,7



Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

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- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- *&* document member of the same patent family

Date of the actual completion of the international search

28 November 2003

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16/12/2003

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PCT/GB 03/01863

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5 371 035 A (PFIESTER JAMES R ET AL) 6 December 1994 (1994-12-06) column 2, line 54 -column 5, line 60; figures 9-13 ----	6,7
A	US 5 212 110 A (KIRSCH HOWARD C ET AL) 18 May 1993 (1993-05-18) column 2, line 20 -column 4, line 55 ----	6,7
A	US 6 249 031 B1 (KUEK JOE JIN ET AL) 19 June 2001 (2001-06-19) abstract ----	6,7
A	WO 02 15244 A (CHENG ZHI YUAN) 21 February 2002 (2002-02-21) abstract -----	2,3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/01863

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 8, 9, 10
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 8,9,10

The subject matter of claim 8 and 9 is obscure (Art 6 PCT) to such an extent that meaningful search is impossible. Furthermore, claim 10 does not comply with the requirements of Rule 6(2) PCT.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Internat. Application No.

PCT/GB 03/01863

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5371035	A	06-12-1994	NONE
US 5212110	A	18-05-1993	NONE
US 6249031	B1	19-06-2001	US 6093613 A SG 71812 A1
WO 0215244	A	21-02-2002	EP 1309989 A2 WO 0215244 A2 US 2003155568 A1 US 2003168654 A1 US 2002072130 A1
			25-07-2000 18-04-2000 14-05-2003 21-02-2002 21-08-2003 11-09-2003 13-06-2002